

Econ 311: Problem Set #3

Monday, November 9, 2009

Question.1 A municipal bus company has started operations in a new subdivision. Records were kept on the numbers of riders from this subdivision during the early-morning service. The accompanying table shows proportions over all weekdays.

Number of riders	20	21	22	23	24	25	26	27
Proportion	0.02	0.12	0.23	0.31	0.19	0.08	0.03	0.02

- a Draw the probability function.
- b Calculate and draw the cumulative probability function.
- c What is the probability that on a randomly chosen weekday there will be at least 24 riders from the subdivision on this service?
- d Two weekdays are chosen at random. What is the probability that on both of these days there will be fewer than 23 riders from the subdivision on this service?
- e Find the mean and standard deviation of the number of riders from this subdivision on this service on a weekday.
- f If the cost of a rider is \$1.50, find the mean and standard deviation of the total payments of riders from this service on a weekday.

Question.2 The San Francisco Giant are to play a series of five games in New York against the New York Yankees. For any one game it is estimated that the probability of a Giant win is 0.5. The outcomes of the five games are independent of one another.

- a What is the probability that the Giant will win all five games?
- b What is the probability that the Giant will win a majority of the five games?
- c If the Giant win the first game, what is the probability that they will a majority of the five games?
- d Before the series begins, what is the expected number of Giant wins in these five games?
- e If the Giant win the first game, what is the expected number of Twins wins in the five game series?

Question.3 A bank executive is presented with loan applications from 10 people. The profiles of the applicants are similar, except 5 minorities and 5 are not minorities. In the end the executive approves 6 of the applications. If these 6 approvals are chosen at radome from the 10 applications, what is the probability that less than half the approvals will be of applications involving minorities?

Question.4 The number of accidents in a production facility has a Passion distribution with a mean of 2.6 per month.

- a For a given month what is the probability there will be fewer than two accidents?
- b For a given month what is the provability there will be more than three accidents?

Question.5 Consider the joint probability distribution.

		X	
		1	2
Y	0	0.30	0.20
	1	0.25	0.25

- a Compute the marginal probability distributions for X and Y,
- b Compute the covariance and correlation for X and Y.
- c Compute the mean and variance for the linear function $W = 2X + Y$.